PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To:
King & Spalding
Attn. Knowles , Sherry M.
191 Peachtree Street
Atlanta, GA 30303-1763
UNITED STATES OF AMERICA

0619 1.105023

Applicant's or agent's file reference NOV 1007 PCT	Date of mailing *(day/month/year)* 04/03/2002 **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 01/ 16671	International filing date *(day/month/year)* 23/05/2001
Applicant NOVIRIO PHARMACEUTICALS LIMITED	

1. [X] The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Margarita Tzelepi

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped),whether

(i) the claim is unchanged;

(ii) the claim is cancelled;

(iii) the claim is new;

(iv) the claim replaces one or more claims as filed;

(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."

2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."

3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."

4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
NOV 1007 PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US 01/ 16671	23/05/2001	23/05/2000
Applicant		
NOVIRIO PHARMACEUTICALS LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 16 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [X] **Certain claims were found unsearchable** (See Box I).

3. [X] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. _____

   [ ] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [X] None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/16671

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07H19/06 C07H19/10 C07H19/16 C07H19/20 A61K31/7068
A61K31/7076 A61P31/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C07H A61K A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 99 43691 A (CHOI YONGSEOK ;CHU CHUNG K (US); HONG JOON H (US); SHI JUNXING (US) 2 September 1999 (1999-09-02) compounds 30,31 page 11, lines 25-31 the whole document --- -/--	25, 28-39, 52-63, 76, 79-90, 103-114, 127, 130-141, 154-165, 178

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
6 February 2002	04. 03. 2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,	de Noov. A

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	X. MARTIN ET AL.: "Intramolecular hydrogen bonding in primary hydroxyl of thymine 1-(1-deoxy-beta-D-psicofuranosyl) nucleoside" TETRAHEDRON, vol. 50, 1994, pages 6689-6694, XP002176339	4,7,10, 23
Y	page 6689, introduction figure 1	25,28, 31,34, 37,52, 55,58, 61,76, 79,82, 85,88, 103,106, 109,112, 127,130, 133,136, 139,154, 157,160, 163,178

X	E. ROGERS ET AL.: "2'C-alkylribonucleosides: design, synthesis, and conformation" NUCLEOSIDES & NUCLEOTIDES, vol. 16, 1997, pages 1457-1460, XP002189347	2,5,8, 11,20, 22-24
Y	compounds 8a-f page 1457, paragraph 1	25,29, 32,35, 38,53, 56,59, 62,76, 80,83, 86,89, 104,107, 110,113, 127,131, 134,137, 140,155, 158,161, 164,178

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X Y	GB 1 209 654 A (MERCK & CO INC) 21 October 1970 (1970-10-21) page 2 lines 17-19 the whole document	5,6,8,9, 11,12 25,30, 33,36, 39,54, 57,60, 63,76, 81,84, 87,90, 105,108, 111,114, 127,132, 135,138, 141,156, 159,162, 165,178
X	J. FARKAS, F. SORM: "Nucleic acids components and their analogues. XCIV. Synthesis of 6-amino-9-(1-deoxy-beta-D-psicofuranosyl)purine" COLLECTION CZECHOSLOV. CHEM. COMM., vol. 32, 1967, pages 2663-2667, XP001016337 cited in the application structure I and III	1,7,10, 14
X	H. HREBABECKY, J. FARKAS: "Synthesis of 7- and 9-beta-D-psicofuranosylguanine and their 1'-deoxy derivatives" COLLECTION CZECHOSLOV. CHEM. COMM., vol. 39, 1974, pages 2115-2123, XP002176340 compound VIII page 2116	1,7,10, 13
X	WOLFE M S ET AL: "A Concise Synthesis of 2'-C-Methylribonucleosides" TETRAHEDRON LETTERS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 36, no. 42, 16 October 1995 (1995-10-16), pages 7611-7614, XP004027097 ISSN: 0040-4039 compounds 5a-d, SMDC, SMIU	2,5,8, 11,20,24
X	P. FRANCHETTI ET AL.: "2'-C-Methyl analogues of selective adenosine receptor agonists: Synthesis and binding studies" J. MED. CHEM., vol. 41, 1998, pages 1708-1715, XP002189348 compounds 4-9,12,13	2,8,11, 20

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	FR 1 521 076 A (MERCK & CO INC) 12 April 1968 (1968-04-12) the whole document	2,8,11
X	OIVANEN M ET AL: "ADDITIONAL EVIDENCE FOR THE EXCEPTIONAL MECHANISM OF THE ACID-CATALYSED HYDROLYSIS OF 4-OXOPYRIMIDINE NUCLEOSIDES: HYDROLYSIS OF 1-(1-ALKOXYALKYL)URACILS, SECONUCLEOSIDES, 3'-C-ALKYL NUCLEOSIDES AND NUCLEOSIDE 3',5'-CYCLIC MONOPHOSPHATES" JOURNAL OF THE CHEMICAL SOCIETY, PERKIN TRANSACTIONS 2, CHEMICAL SOCIETY. LETCHWORTH, GB, vol. 2, 1994, pages 309-314, XP000886596 ISSN: 1472-779X compounds 14a-c	3,6,9,12
X	GB 1 163 103 A (MERCK & CO INC) 4 September 1969 (1969-09-04) the whole document	3,9,12
X	S.P. ONG ET AL.: "Synthesis of 3'-C-methyladenosine and 3'-C-methyluridine diphosphates and their interaction with the ribonucleoside diphosphate reductase from Corynebacterium nephridii" BIOCHEMISTRY, vol. 31, 1992, pages 11210-11215, XP002189349 compounds 8-14	3,6,9,12
X	L.N. BEIGELMAN ET AL. : "Epimerization during acetolysis of 3-O-acetyl-5-O-benzoyl-1,2-O-isopropyliden e-3-C-methyl-alfa-D-ribofuranose." CARBOHYDRATE RESEARCH, vol. 181, 1988, pages 77-88, XP002189350 compounds 13-15	3,6,9,12
X	H. HREBABECKY ET AL.: "Nucleic acid components and their analogues. CXLIX. Synthesis of pyrimidine nucleosides derived from 1-deoxy-D-psicose" COLLECTION CZECHOSLOV. CHEM. COMM., vol. 37, 1972, pages 2059-2065, XP002176338 compound I,II,III page 2060	4,7,10, 17,23,24

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	A. GROUILLER ET AL.: "Novel p-toluenesulfonylation and thiocarbonylation of unprotected thymine nucleosides" SYNLETT, 1993, pages 221-222, XP002189351 comound 1 ---	4,7,10, 17
X	S.N. MIKHAILOV ET AL.: "Hydrolysis of 2'- and 3'-c-methyluridine 2',3'-monophosphates and interconversion and dephosphorylation of the resulting 2'- and 3'-monophosphates: Comparison with the reactions of uridine monophosphates" J. ORG. CHEM., vol. 57, 1992, pages 4122-4126, XP002189352 compounds 2-5 ---	5,6,8,9, 11,12,24
X	MATSUDA A ET AL: "Nucleosides and nucleotides. 94. Radical deoxygenation of tert-alcohols in 1-(2-C-alkylpentafuranosyl)pyrimidines: Synthesis of (2'S)-2'-deoxy-2'-C-methylcytidine, an antileukemic nucleoside" JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY. WASHINGTON, US, vol. 34, 1991, pages 234-239, XP002178370 ISSN: 0022-2623 compounds 1i,j,4a,b,7,8,13,17 ---	5,8,11, 22
X	E. WALTON ET AL.: "Branched-chain sugar nucleosides. V. Synthesis and antiviral properties of several branched-chain sugar nucleosides" J. MED. CHEM., vol. 12, 1969, pages 306-309, XP002189353 compounds 5,6,10,12,14,16-18 ---	5,6,8,9, 11,12
X	V.L. TUNITSKAYA ET AL.: "Substrate properties of C'-methyl UTP derivatives in T7 RNA polymerase reactions. Evidence for N-type NTP conformation" FEBS LETTERS, vol. 400, 1997, pages 263-266, XP002189354 compounds 3 and 4 ---	5,6,8,9, 11,12

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	A. MATSUDA ET AL.: "Radical deoxygenation of tert-alcohols in 2'-branched-chain sugar pyrimidine nucleosides: synthesis and antileukemic activity of 2'-deoxy-2'(S)-methylcytidine" CHEM. PHARM. BULL., vol. 35, 1987, pages 3967-3970, XP002189355 compounds 3b,7,15 ---	5,8,11, 22
X	A. MATSUDA ET AL.: "Alkyl addition reaction of pyrimidine 2'-ketonucleosides: synthesis of 2'-branched-chain sugar pyrimidine nucleosides" CHEM. PHARM. BULL., vol. 36, 1988, pages 945-953, XP002189356 compounds 13a,b,19a,b,20a,b ---	5,8,11, 22
X	ALTMANN ET AL: "The effects of 2'- and 3'-alkyl substituents on oligonucleotide hybridization and stability" BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, OXFORD, GB, vol. 4, no. 16, 1994, pages 1969-1974, XP002105090 ISSN: 0960-894X compounds 2,9,10 ---	6,8,9
X	L.N. BEIGELMAN ET AL.: "A general method for synthesis of 3'-alkylnucleosides" NUCLEIC ACIDS SYMP. SER., vol. 9, 1981, pages 115-118, XP001059721 page 116 ---	6,9,12
X	S.N. MIKHAILOV ET AL.: "Synthesis and properties of 3'-C-methylnucleosides and their phosphoric esters" CARBOHYDRATE RESEARCH , vol. 124, 1983, pages 75-96, XP002189357 compounds 9,12,14,20,21 ---	6,9,12
X	Y. ITOH ET AL.: "Divergent stereocontrolled approach to the synthesis of uracil nucleosides branched at the anomeric position" J. ORG. CHEM., vol. 60, 1995, pages 656-662, XP002189358 compounds 22,23,31 --- -/--	7,10

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	FAIVRE-BUET V ET AL: "SYNTHESIS OF 1'-DEOXYPSICOFURANOSYL-DEOXYNUCLEOSIDES AS POTENTIAL ANTI-HIV AGENTS" NUCLEOSIDES & NUCLEOTIDES, DEKKER, NEW YORK,NY,, US, vol. 11, no. 7, 1992, pages 1411-1424, XP001025527 ISSN: 0732-8311 compounds 1-3 ---	7,10
X	SERAFINOWSKI P J ET AL: "NEW METHOD FOR THE PREPARATION OF SOME 2'- AND 3'-TRIFLUOROMETHYL- 2',3'-DIDEOXYURIDINE DERIVATIVES" TETRAHEDRON, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 56, no. 2, 1999, pages 333-339, XP001050335 ISSN: 0040-4020 Scheme 1 ---	8,9,11, 12
X	HARAGUCHI K ET AL: "PREPARATION AND REACTIONS OF 2'- AND 3'-VINYL BROMIDES OF URACIL-NUCLEOSIDES: VERSATILE SYNTHONS FOR ANTI-HIV AGENTS" TETRAHEDRON LETTERS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 32, no. 28, 1991, pages 3391-3394, XP001041740 ISSN: 0040-4039 compounds 14,21 ---	8,9
X	S.N. MIKHAILOV ET AL.: "Substrate properties of C'-methylnucleoside and C'-methyl-2'-deoxynucleoside 5'-triphosphates in RNA and DNA synthesis reactions catalysed by RNA and DNA polymerases" NUCLEOSIDES & NUCLEOTIDES, vol. 10, 1991, pages 339-343, XP001059775 compounds 3b,d,4b,d ---	8,9,11, 12
X	AKIRA MATSUDA ET AL: "NUCLEOSIDES AND NUCLEOTIDES 104. RADICAL AND PALLADIUM-CATALYZED DEOXYGENATION OF THE ALLYLIC ALCOHOL SYSTEMS IN THE SUGAR MOIETY OF PYRIMIDINE NUCLEOSIDES" NUCLEOSIDES & NUCLEOTIDES, DEKKER, NEW YORK,NY,, US, vol. 11, no. 2/4, 1992, pages 197-226, XP000573757 ISSN: 0732-8311 compounds 28,31 ---	8,9

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	T. IINO ET AL.: "Nucleosides and nucleotides. 139. Stereoselective synthesis of (2'S)-2'-C-alkyl-2'-deoxyuridines" NUCLEOSIDES & NUCLEOTIDES, vol. 15, 1996, pages 169-181, XP002189359 compound 9b	8,11
X	SHARMA P K ET AL: "SYNTHESIS OF 3'-TRIFLUOROMETHYL NUCLEOSIDES AS POTENTIAL ANTIVIRAL AGENTS" NUCLEOSIDES, NUCLEOTIDES AND NUCLEIC ACIDS, MARCEL DEKKER, ANN HARBOR, MI, US, vol. 19, no. 4, 2000, pages 757-774, XP001050475 ISSN: 1525-7770 compounds 17,19	8,11
X	J.-C. WU, J. CHATTOPADDYAYA: "A new stereospecific synthesis of '3.1.0! bicyclic cyclopropano analog of 2',3'-dideoxyuridine" TETRAHEDRON, vol. 46, 1990, pages 2587-2592, XP002189360 compound 16	8
X	V. SAMANO, M.J. ROBBINS: "Synthesis and radical-induced ring-opening reactions of 2'-deoxyadenosine-2'-spirocyclopropane and its uridine analogue. Mechanistic probes for ribonucleotide reductases" J. AM. CHEM. SOC., vol. 114, 1992, pages 4007-4008, XP002189361 compounds 8 and 10	8
X	V. SAMANO, M.J. ROBINS: "Nucleic acid related compounds. 77." CAN. J. CHEM., vol. 71, 1993, pages 186-191, XP002189362 compounds 7,14	8,9
X	C.R. JOHNSON, D.R. BHUMRALKAR: "3'-C-Trifluoromethyl ribonucleosides" NUCLEOSIDES & NUCLEOTIDES, vol. 14, 1995, pages 185-194, XP002189363 compounds 7,9,11,12	9,12

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	S. LAVAIRE ET AL.: "3'-Deoxy-3'-C-trifluoromethyl nucleosides: synthesis and antiviral evaluation" NUCLEOSIDES & NUCLEOTIDES, vol. 17, 1998, pages 2267-2280, XP002189364 compound 11 ---	9,12
X	TRITSCH D D ET AL: "3'-beta-ethynyl and 2'-deoxy-3'-beta-ethynyl adenosines: first 3'-beta-branched-adenosines substrates of adenosine deaminase" BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, OXFORD, GB, vol. 10, no. 2, January 2000 (2000-01), pages 139-141, XP004188802 ISSN: 0960-894X compound 3 ---	9,12
X	I.I. FEDEROV ET AL.: "3'-C-Branched 2'-deoxy-5-methyluridines: Synthesis, enzyme inhibition, and antiviral properties" J. MED. CHEM., vol. 35, 1992, pages 4567-4575, XP002189365 compounds 12-14,16,17,19 ---	9,12
X	S. CZERNECKI, A. EZZITOUNI: "Synthesis of various 3'-branched 2',3'-unsaturated pyrimidine nucleosides as potential anti-HIV agents" J. ORG. CHEM., vol. 57, 1992, pages 7325-7328, XP002189366 compound 1 ---	9
X	H. HATTORI ET AL.: "Nucleosides and nucleotides. 175." J. MED. CHEM., vol. 41, 1998, pages 2892-2902, XP002189367 Compounds 14-17d ---	9,12
X	FR 2 662 165 A (UNIV PARIS CURIE) 22 November 1991 (1991-11-22) example 16 ---	9

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	A. ROSENTHAL, S.N. MIKHAILOV: "Branched-chain sugar nucleosides. Synthesis of 3'-C-ethyl (and 3'-C-butyl)uridine" CARBOHYDRATE RESEARCH, vol. 79, 1980, pages 235-242, XP002189368 compounds 12-15 ---	9,12
X	K. HARAGUCHI ET AL.: "Stereoselective synthesis of 1'-C-branched uracil nucleosides from uridine" NUCLEOSIDES & NUCLEOTIDES, vol. 14, 1995, pages 417-420, XP002189369 compounds 17,18 ---	10
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X	M. KAWANA ET AL.: "The deoxygenations of tosylated adenosine derivatives with Grignard reagents" NUCLEIC ACIDS SYMP. SER., vol. 17, 1986, pages 37-40, XP001059719 compound 13 ---	11
X	K. WALCZAK, E.B. PEDERSEN: "Synthesis of 1-(3-alkyl-2,3-dideoxy-D-pentofuranosyl)uracils with potential anti-HIV activity" ACTA CHEM. SCAND., vol. 45, 1991, pages 930-934, XP002189370 compound 10c ---	12
X	H. USUI, T. UEDA: "Synthesis of 2'-deoxy-8,2'-ethanoadenosine and 3'-deoxy-8,3'-ethanoadenosine (Nucleosides and nucleotides. LXIV)" CHEM. PHARM. BULL., vol. 34, 1986, pages 15-23, XP002189371 compound 23 ---	12
A	US 5 977 061 A (DE CLERCQ ERIK DESIRE ALICE ET AL) 2 November 1999 (1999-11-02) column 1 -column 4 column 13, line 6 - line 28 ---	1,130

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	LEYSSEN P ET AL: "PERSPECTIVES FOR THE TREATMENT OF INFECTIONS WITH FLAVIVIRIDAE" CLINICAL MICROBIOLOGY REVIEWS, WASHINGTON, DC, US, vol. 13, no. 1, January 2000 (2000-01), pages 67-82, XP000889854 ISSN: 0893-8512 page 71, right-hand column -page 72, left-hand column ---	1,130
A	BERENGUER M ET AL: "HEPATITIS B AND C VIRUSES: MOLECULAR IDENTIFICATION AND TARGETED ANTIVIRAL THERAPIES" PROCEEDINGS OF THE ASSOCIATION OF AMERICAN PHYSICIANS, BLACKWELL SCIENCE, INC, CAMBRIDGE, MA, US, vol. 110, no. 2, 1998, pages 98-112, XP000885891 ISSN: 1081-650X abstract -----	52,103

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/16671

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 79-129 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound.

2. [X] Claims Nos.:
see FURTHER INFORMATION sheet PCT/ISA/210
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

X

1. [ ] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[X] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 7-12, 25-27, 34-39, 58-63, 76-78, 85-90, 109-114, 127-129, 136-141, 160-165, 178-180 (all partially)

The initial phase of the search revealed a very large number of documents relevant to the issue of novelty. So many documents were retrieved that it is impossible to determine which parts of the claims may be said to define subject-matter for which protection might legitimately be sought (Article 6 PCT). For these reasons it appears impossible to execute a meaningful search and/or to issue a complete search report over the whole breadth of the above mentioned claims. Consequently, the search has been restricted to the compounds of the above mentioned claims where R6 is methyl, ethyl, propyl, butyl, CF3 or Br-vinyl. Furthermore, in the case where R6 is methyl for compounds XI, XIV, XVII, or XVIII of the above mentioned claims, only several documents were cited.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1,4,13-18,25-27 (in part),28,31,40-45,52,55,64-69, 76-78 (in part),79,82,91-96,103,106,115-120, 127-129 (in part),130,133,142-147,154,157,166-171, 178 (in part),180 (in part)

   Compounds of Formula I of claim 1 or compounds of Formula IV of claim 4, pharmaceutical compositions and uses pertaining thereto.

2. Claims: 2,5,19-24,25-27 (in part),29,32,46-51,53,56,70-75, 76-78 (in part),80,83,97-102,104,107,121-126, 127-129 (in part),131,134,148-153,155,158,172-177, 178 (in part),179, 180 (in part)

   Compounds of Formula II of claim 2 or compounds of Formula V of claim 5, pharmaceutical compositions and uses pertaining thereto.

3. Claims: 3,6,25-27 (in part),30,33,54,57,76-78 (in part),81, 84,105,108,127-129 (in part),132,135,156,159, 178 (in part),180 (in part)

   Compounds of Formula III of claim 3 or compounds of Formula VI of claim 6, pharmaceutical compositions and uses pertaining thereto.

4. Claims: 7,25-27 (in part),34,58,76-78 (in part),85,109, 127-129 (in part),136,160,178 (in part), 180 (in part)

   Compounds of Formulae VII or VIII or IX of claim 7, pharmaceutical compositions and uses pertaining thereto, where the compounds do not fall within one of the earlier described subjects.

5. Claims: 8,25-27 (in part),35,59,76-78 (in part),86,110, 127-129 (in part),137,161,178 (in part), 180 (in part)

   Compounds of Formulae X or XI or XII of claim 8, pharmaceutical compositions and uses pertaining thereto, where the compounds do not fall within one of the earlier described subjects.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

6. Claims: 9,25-27 (in part),36,60,76-78 (in part),87,111,
127-129 (in part),138,162,178 (in part),
180 (in part)

Compounds of Formulae XIII or XIV or XV of claim 9, pharmaceutical compositions and uses pertaining thereto, where the compounds do not fall within one of the earlier described subjects.

7. Claims: 10, 25-27 (in part),37,61,76-78 (in part),88,112,
127-129 (in part),139,163,178 (in part),
180 (in part)

Compounds of Formula XVI of claim 10, pharmaceutical compositions and uses pertaining thereto, where the compounds do not fall within one of the earlier described subjects.

8. Claims: 11,25-27 (in part),38,62,76-78 (in part),89,113,
127-129 (in part),140,164,178 (in part),
180 (in part)

Compounds of Formula XVII of claim 11, pharmaceutical compositions and uses pertaining thereto, where the compounds do not fall within one of the earlier described subjects.

9. Claims: 12,25-27 (in part),39,63,76-78 (in part),90,114,
127-129 (in part),141,165,178 (in part),
180 (in part)

Compounds of Formula XVIII of claim 12, pharmaceutical compositions and uses pertaining thereto, where the compounds do not fall within one of the earlier described subjects.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 01/16671

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